ANEURISMAL VARIX.

BY J. CLARK STEWART, M.D.,

OF MINNEAPOLIS, MINN.,

Professor of the Principles of Surgery in the University of Minnesota.

ANEURISMAL VARIX is defined as a pulsating swelling caused by an opening of communication between an artery and a contiguous vein. It has no aneurismal sac, and is to be distinguished from a varicose aneurism, which has such a sac between the artery and vein communicating with both. It is generally admitted that these lesions are regularly the result of traumatism, commonly incised, stab- or shot-wounds involving an artery and a contiguous vein. A noteworthy exception is the not infrequent occurrence of pulsating exophthalmos without traumatic history, this syndrome being often caused by the presence of a communication between the carotid artery and the cavernous sinus at the side of the body of the sphenoid bone.

The ophthalmologists have studied this condition carefully and their work would go to prove that in this location at least aneurismal varix may be caused by pathologic conditions other than those secondary to traumatism. De Schweinitz states that only 60 per cent. of some hundred cases listed gave any history of traumatism, in view of which statement it seems probable that a careful study of a large series of cases of aneurismal varices of the extremities might cause surgeons to modify their views as to the necessity of a traumatic origin.

From a surgical standpoint aneurismal varices naturally divide into two classes differing widely in their adaptability to treatment. First, those occurring in the neck and upper extremity. Second, those of the abdomen and lower extremity.

Surgically these classes exhibit a most important and striking difference, those of the first allowing the free application of ligation methods without marked danger of gangrene, on account of the perfect and abundant collateral circulation exist-

ing at their respective sites; while on the contrary, in the second class, vascular conditions make similar methods extremely hazardous from the great frequency with which gangrene follows the simultaneous ligation of vein and artery in the lowet extremity. It is, therefore, most desirable that methods other than the classic treatment of double ligation of the vessels with extirpation of the sac or point of communication be adopted.

The symptoms of aneurismal varix are striking. Soon, or during the healing of a wound that affects the blood-vessels, there will appear a pulsating tumor over which can be felt a marked thrill, and heard a harsh bruit. There will also be progressive enlargement of the distal veins to which will be transmitted the thrill and bruit. There will also be pain, numbness, swelling and disability of the affected extremity.

Time seems to offer no cure for these lesions and as a rule the disagreeable symptoms increase with years, although there may be no very great change in the objective signs.

In true aneurismal varix the treatment must be purely operative, as there is no aneurismal sac to be affected by pressure and the other means used in the treatment of other forms of aneurism. Nothing but methods which entirely stop the circulation at the affected point are of avail.

A time-honored method is double ligation of the vessels with or without extirpation of the affected segment and the saculated dilatation that often exists in the vein opposite the point of entrance of arterial blood. This is effective and gives satisfactory results in the neck and upper extremity, but in the lower causes too high a percentage of gangrene with loss of limb, or even life, to justify its routine adoption.

Direct suture of the opening in the arterial wall after the method of Matas is the operation of choice in these cases, and possibly in all suitable cases no matter where located. The procedure can be varied according to the conditions present. The dilated vein can be opened by a direct incision and the arterial gap located and sutured through this opening, the vein then ligated above and below the lesion and its walls sutured

in tiers over the arterial suture, as is done in the Matas operation for popliteal aneurism.

The recent improvements in the technic of vascular suture would seemingly make possible the suture of the communicating opening through an incision in the vein followed by suture of this latter defect, leaving the circulation unimpaired in both vein and artery. Or, after locating the point of communication the artery and vein could be carefully separated and the opening in each sutured.

It has also been proposed to shut off the opening of communication by a ligature passed around it without opening either vessel. This does not seem a probable method of cure, as such a ligature would need to be permanent and might then cause ulceration and subsequent hæmorrhage or relapse. Dr. C. H. Mayo reports a successful use of this method in one recent case in the popliteal region.

In all cases any method of treatment is more readily applied the more recent the case, the less dense and abundant the scar-tissue, and the less permanent dilatation and tortuosity has been caused in the affected veins.

In very old cases, especially when resulting from shot-wounds, the conditions at the time of operation may be such as to make any formal procedure extremely difficult.

I have to report such a case occurring at the elbow-joint, caused by a charge of buckshot at close range, producing a compound fracture of the lower end of the humerus with sloughing of most of the soft parts about the joint. Healing was much delayed, and pulsation was noticed in the wound before it was completely closed. The man finally recovered with a partly ankylosed elbow and an aneurismal varix which he neglected until it had reached a large size, and until the pressure of the immense veins upon the ulnar nerve caused intolerable pain and much muscular weakness:

September, 1903, E. H., American, married. Five years ago, in a quarrel, patient was shot in the left arm and side with a load of buckshot, much damage being done about the elbow-joint

FIG. 1.—Aneurismal varix before operation.

FIG. 2.—Condition of arm immediately after operation for removal of aneurismal varix.

The wound suppurated and healed slowly, and before it healed a pulsating swelling was noticed opposite the elbow. This has slowly increased in size and for the past year there has been great pain in the arm, referred to the ulnar region.

On examination, patient has a very marked varicosity of the superficial veins on the ulnar side of the forearm, extending from the wrist upward to the middle of the arm. (Fig. 1.) The veins are three-quarters of an inch in diameter and pulsate vigorously. At the elbow there is a pulsating mass over which a harsh bruit is heard and thrill felt. The same loud bruit is heard at a point one and a half inches above the wrist on the ulnar side, and to a less degree over the whole mass of varicose veins. Patient's general condition is good; no history of syphilis or other constitutional trouble. There is partial ankylosis of the elbow joint, and the anterior and lateral surfaces of the forearm at the elbow are a mass of scar-tissue interspersed with medium-sized veins.

Operation September 26, 1903. An incision was made over the mass at the elbow-joint, and an attempt was made to isolate the aneurismal site by dissection. This was found to be impracticable on account of the large amount of scar-tissue filled with good-sized vessels, so the dissection was carried upward into the arm until a healthy area in the brachial artery was laid bare. This vessel was then doubly ligated with catgut. The large veins of the forearm were next exposed and removed from the wrist up to the aneurism. At the wrist was found a large communication with the deep veins of the forearm, and upon opening the fascia a vessel over one inch in diameter was found in close juxtaposition to the ulnar nerve, running from the wrist to the elbow. This was also removed, and the radial and ulnar arteries were ligated just below the bifurcation of the brachial and about five inches below the first ligation of the brachial artery. The large wound was sutured in layers without drainage and the arm was protected by voluminous dressings.

The hand was cold and circulation poor for the first forty-eight hours, after which the conditions improved and the case went on to uneventful recovery. There was no necrosis of the skin except an area three-fourths by one-fourth of an inch at the site of the first incision in the scar-tissue at the elbow, probably due to rough handling during the early part of the dissection. One month after operation the patient returned to his former

vocation of guide and oarsman at a hunting resort, being entirely relieved of the pain in the ulnar-nerve region and having no pulsation at the site of the aneurism and none in the radial artery. During the next year he complained of coldness in the arm, especially during the winter months.

April, 1905, there is good pulsation in the radial artery at the wrist. Patient got drunk and fell and injured his arm, resulting in an abscess near the elbow which was very slow in healing.

This case is unusual on account of its long duration and the extreme distention of the veins with the resulting pain, numbness and disability. The operation was unusual only in the extensive removal of the dilated veins, and this was done because it was thought that the long duration of their distention would preclude their return to anything like normal calibre. Microscopic examination of such dilated and varicose veins regularly shows great overgrowth of connective tissue arranged irregularly, the wall of the vein being in some places greatly thickened and in others much thinned by dilatation. It is difficult to understand how such conditions could disappear even after entire removal of the abnormal arterial pressure.

The result after three years seems to justify the operative methods, as at the present time the man has a useful arm and earns his living as a guide and oarsman at a hunting resort. He has now a fair radial pulse and the circulation of the limb seems perfect except about the elbow in the dense scar. In this region on two occasions since the operation he has suffered from obstinately sluggish ulcers. On both occasions he fell and bruised his elbow severely while intoxicated, causing abscesses which refused to heal promptly after evacuation. The appearance of the resulting ulcers was much like those seen in embolic gangrene, where the tissues seem to be half dead but will neither become frankly necrotic nor take on healthy action towards healing.

This sluggish ulceration was, however, probably due more to the character of the scar-tissue than to the shutting off of the circulation by the operation, as the ligations of the radial and ulnar arteries were both above their recurrent branches,

and that of the brachial below both profundæ branches, so that the anastomotica magna was the only considerable branch whose circulation was interfered with.

It is to be noted that the ulceration occurred on both sides and was equally sluggish in healing in each locality, while the anastomotica magna and its branches is distributed mainly to the ulnar aspect of the elbow.

It was my intention to directly attack the seat of communication in this case and either suture the opening, after Matas, or doubly ligate and extirpate the portion of veins and artery immediately about the abnormal opening. On attempting to expose the vessels the density of the scar, and the fact that it was traversed by many large noncollapsing veins, were thought to be prohibitive, so the operation was completed by the ligation of all vessels comprised in the varix as near as possible to the seat of the perforation and incidentally the extirpation of the two very-much-dilated veins on the ulnar side of the forearm, which were considered the cause of the ulnar-nerve symptoms.